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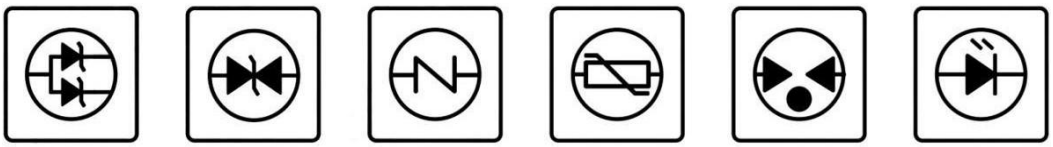
SEMICONDUCTOR



LMV321M5X(MS)

Product specification

DESCRIPTION

The LMV321M5X(MS) is single low voltage (2.7V to 5.5V) operational amplifier which has rail-to-rail output swing capability. The input common-mode voltage range includes ground. The chip exhibits excellent speed-power rat io, achieving 1MHz of bandwidth and 1V/μs of slew rate with low supply current.

The LMV321M5X(MS) S is built with BiCMOS process. It has bipolar input and output stages for improved noise performance, low input offset and higher output current drive.

The LMV321M5X(MS) is available in the package of SOT-23-5.

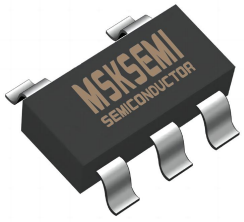
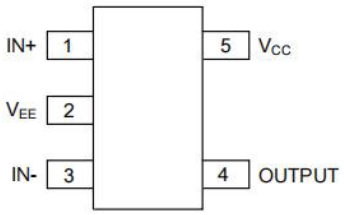
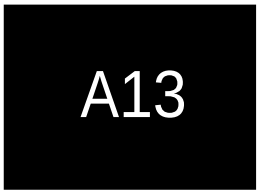
FEATURES (For V_{CC}=5V and V_{EE}=0V, Typical unless Otherwise Noted)

- Guaranteed 2.7V to 5.5V Performance
- No Crossover Distortion
- Gain-Bandwidth Product 1MHz
- Industrial Temperature Range: -40°C to +85°C
- Low Supply Current: 130μA
- Rail-to-Rail Output Swing under 10kΩ Load:
- VOH up to VCC- 10mV
- VOL near to VEE+65mV
- VCM : -0. 1V to VCC-0.8V

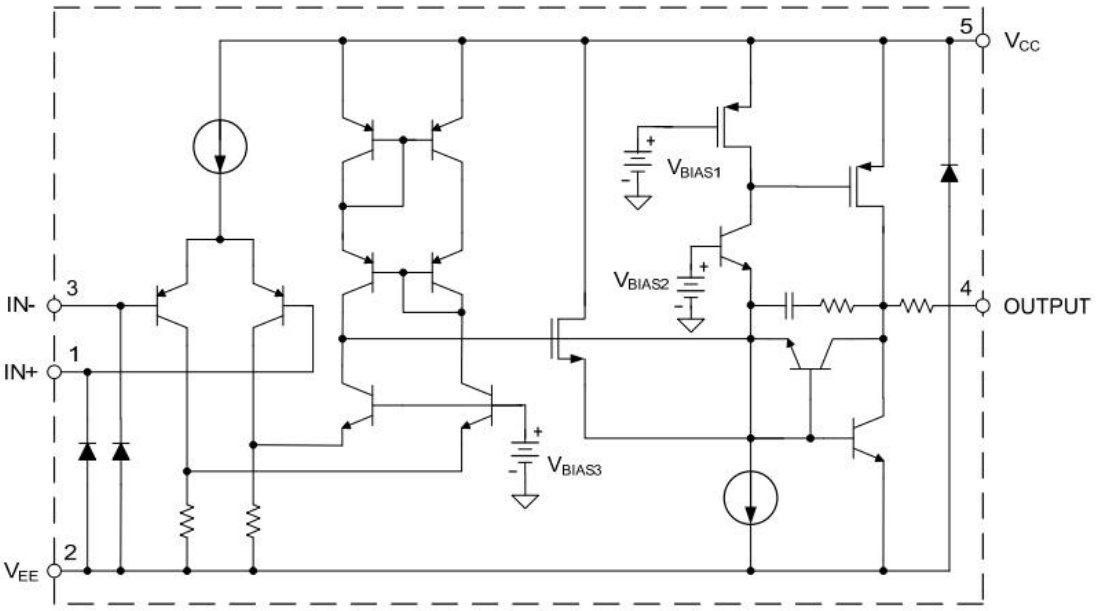
Applications

- Active Filters
- Low Power, Low Voltage Applications
- General Purpose Portable Devices
- Cellular Phone, Cordless Phone
- Battery-Powered Systems

Reference News

PACKAGE OUTLINE	PIN CONFIGURATION	Marking
		
SOT-23-5	IDBV/IDCK Package	SOT-23-5

Functional Block Diagram



Absolute Maximum Ratings (Note 1)

Symbol	Parameter	Rating	Unit
VCC	Power Supply Voltage	6	V
TJ	Operation Junction Temperature	150	ºC
TSTG	Storage Temperature Range	-65 to 150	ºC
TLEAD	Lead Temperature (Soldering, 10 Seconds)	260	ºC
	ESD (Machine Model)	200	V
	ESD (Human Body Model)	2000	V

Note 1: Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

Recommended Operating Conditions

Symbol	Parameter	Min	Max	Unit
VCC	Supply Voltage	2.7	5.5	V
TA	Ambient Operating Temperature Range	-40	85	ºC

Electrical Characteristics

LMV321-2.7V Electrical Characteristic(Asll limits are guaranteed for TA=25ºC, VCC=2.7V, VEE=0V, VCM=1.0V, VO=VCC/2 and RL>1MΩ , limits in bold types are guaranteed for TA=-40ºC to 85ºC, unless otherwise specified. Note 2)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
VIO	Input Offset Voltage			1.7	7	mV
					9	
IB	Input Bias Current			11	250	nA
					500	
IIO	Input Offset Current			5	50	nA
					150	
VCM	Input Common Mode Voltage Range	for CMRR≥50dB	-0.1		1.9	V
ICC	Supply Current	VO=VCC/2, AVCL=1, no load		80	170	μA
					270	
CMRR	Common Mode Rejection Ratio	0≤VCM≤ 1.7V	50	65		dB
PSRR	Power Supply Rejection Ratio	2.7V≤VCC≤5V, VO=1V	50	60		dB
ISOURCE	Output Short Circuit Current	VO=0V	5	20		mA
ISINK		VO=2.7V	10	30		mA
VOH	Output Voltage Swing	RL=10kΩ to 1.35V	2.60	2.69		V
VOL				60	180	mV
GBWP	Gain Bandwidth Product	CL=200pF		1		MHz
0M	Phase Margin			60		Deg
GM	Gain Margin			10		dB

Note 2: Limits over the full temperature are guaranteed by design, but not tested in production.

Electrical Characteristics (Cont.)

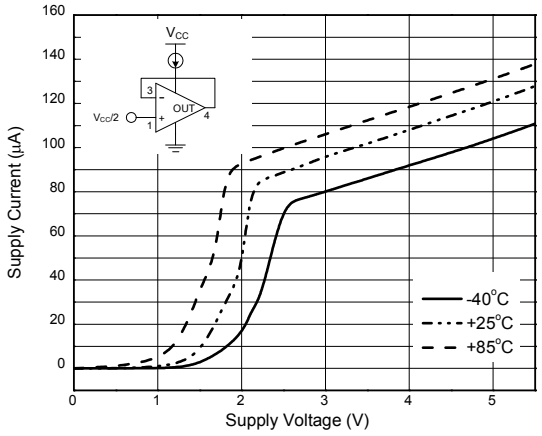
LMV321-5V Electrical Characteristics (All limits are guaranteed for TA=25ºC, VCC=5V, VEE=0V, VCM=2.0V, VO=VCC/2 and RL>1MΩ , limits in bold types are guaranteed for TA=-40ºC to 85ºC, unless otherwise specified. Note 2)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
VIO	Input Offset Voltage			1.7	7	mV
					9	
IB	Input Bias Current			11	250	nA
					500	
IIO	Input Offset Current			5	50	nA
					150	
VCM	Input Common Mode Voltage Range	for CMRR≥50dB	-0.1		4.2	V
ICC	Supply Current	VO=VCC/2, AVCL=1, no load		130	250	μA
					350	
GV	Large Signal Voltage Gain	RL=2kΩ	84	100		dB
			80			
CMRR	Common Mode Rejection Ratio	0≤VCM≤4V	50	65		dB
PSRR	Power Supply Rejection Ratio	2.7V≤VCC≤5V, VO=1V, VCM=1V	50	60		dB
ISOURCE	Output Short Circuit Current	VO=0V	5	60		mA
ISINK		VO=5V	10	160		mA
VOH	Output Voltage Swing	RL=2kΩ to 2.5V	4.7	4.96		V
			4.6			
		RL=10kΩ to 2.5V	4.9	4.99		
			4.8			
VOL		RL=2kΩ to 2.5V		120	300	mV
					400	
		RL=10kΩ to 2.5V		65	180	
					280	
SR	Slew Rate			1		V/μS
GBWP	Gain Bandwidth Product	CL=200pF		1		MHz
0M	Phase Margin			60		Deg
GM	Gain Margin			10		dB

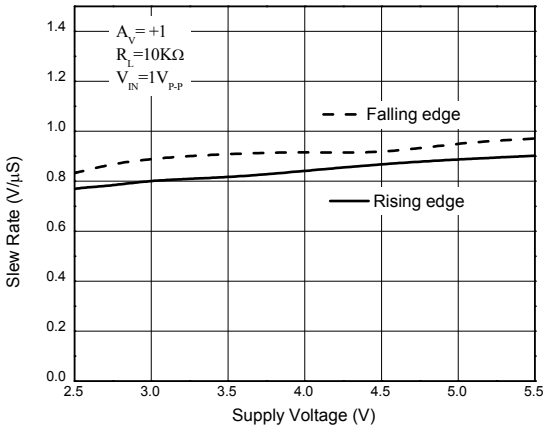
Note 2: Limits over the full temperature are guaranteed by design, but not tested in production.

Performance Characteristics

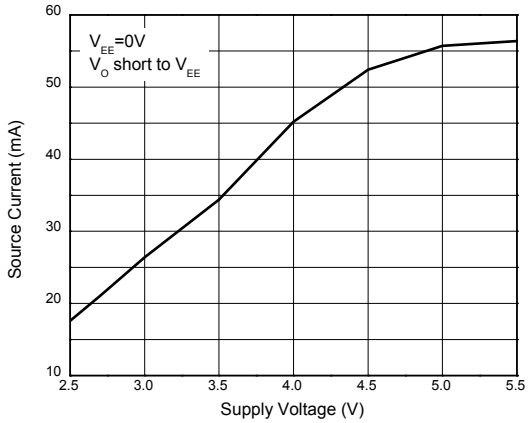
Supply Current vs. Supply Voltage



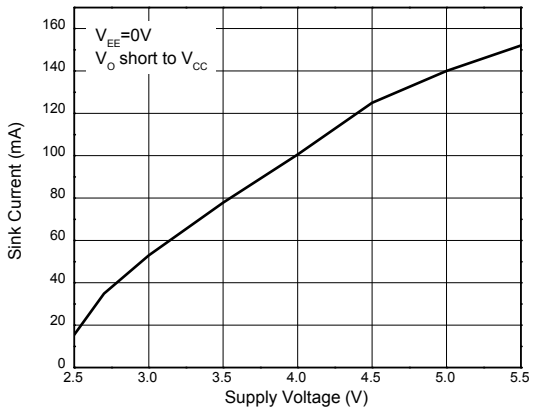
Slew Rate vs. Supply Voltage



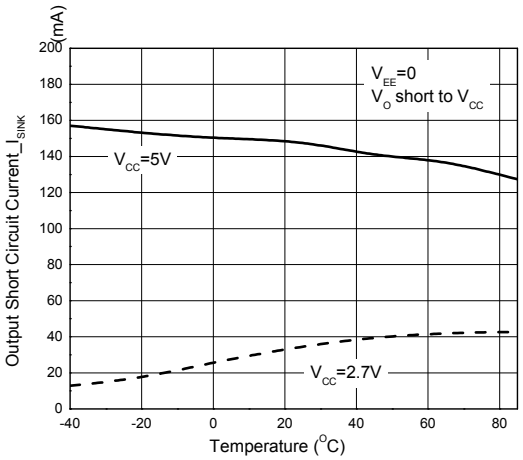
Output Source Current vs. Supply Voltage



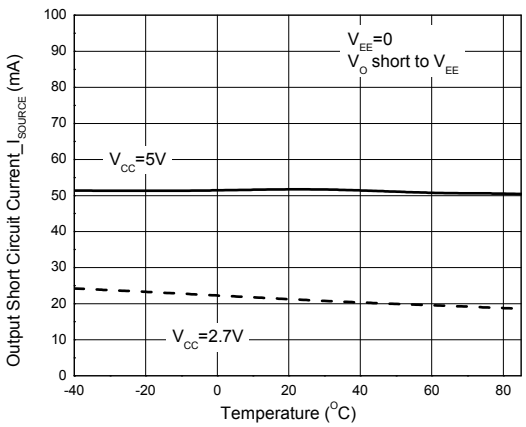
Output Sink Current vs. Supply Voltage



Short Circuit Current_I_{SINK} vs. Temperature

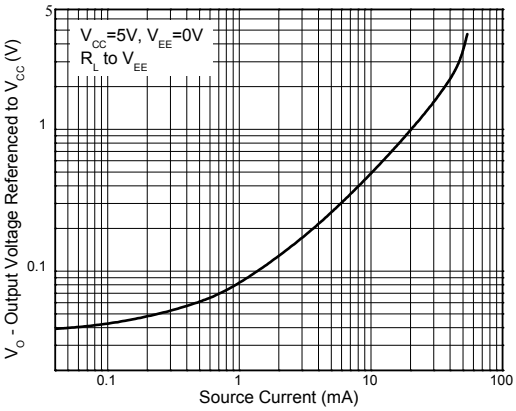


Short Circuit Current_I_{SOURCE} vs. Temperature

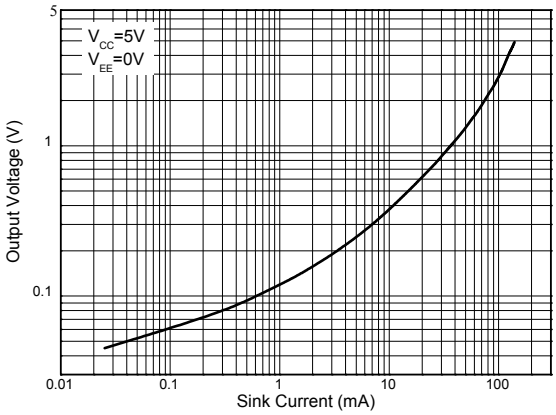


Performance Characteristics (Cont.)

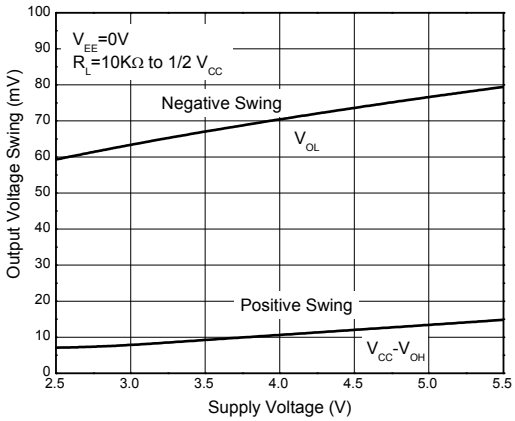
Output Voltage vs. Source Current



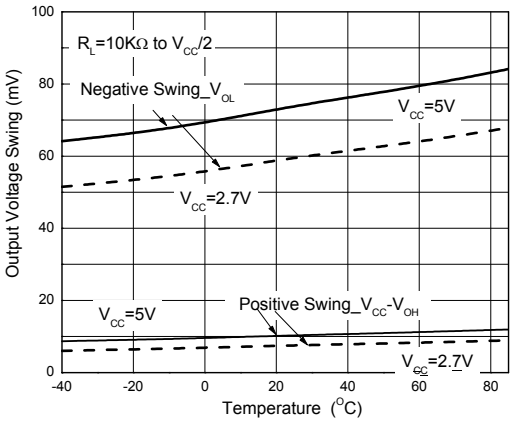
Output Voltage vs. Sink Current



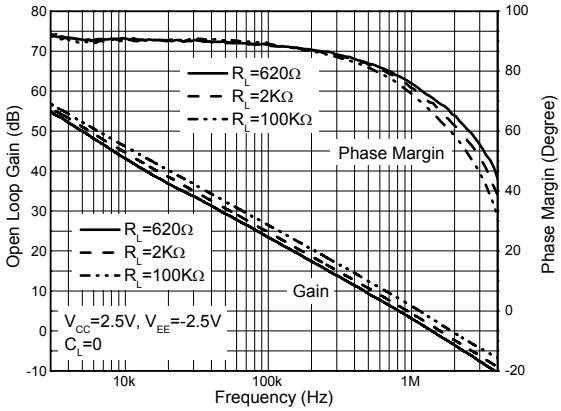
Output Voltage Swing vs. Supply Voltage



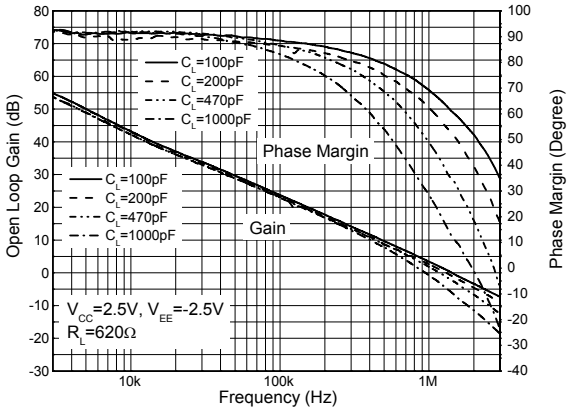
Output Voltage Swing vs. Temperature



Gain and Phase vs. Frequency and Resistive Load

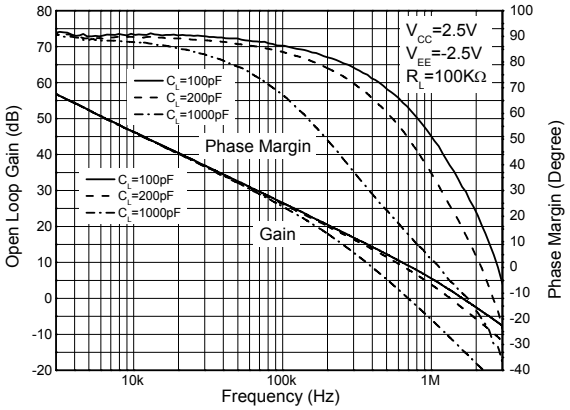


Gain and Phase vs. Frequency and Capacitive Load

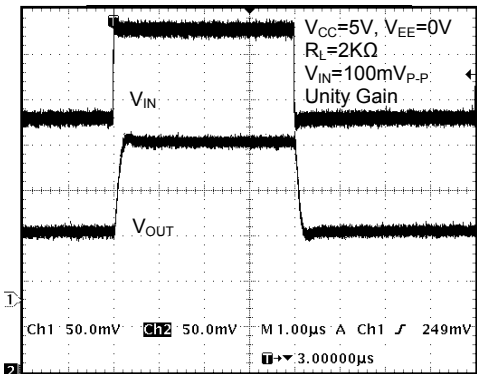


Performance Characteristics (Cont.)

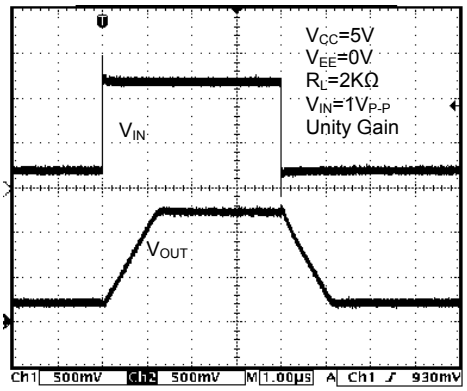
Gain and Phase vs. Frequency and Capacitive Load



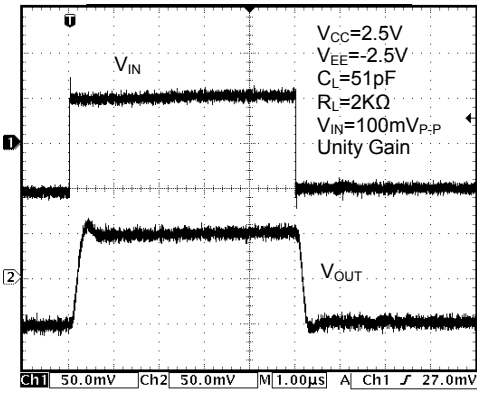
Non-Inverting Input Small Signal Pulse Response



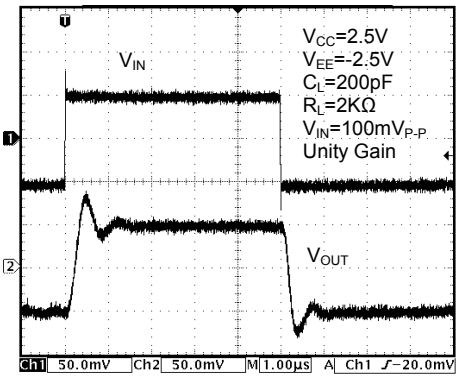
Non-Inverting Input Large Signal Pulse Response



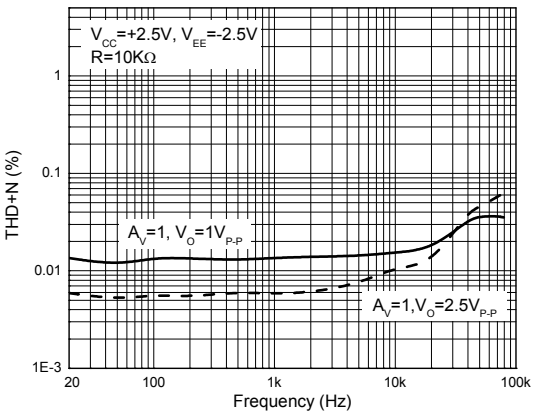
Output with Excessive Capacitive Load



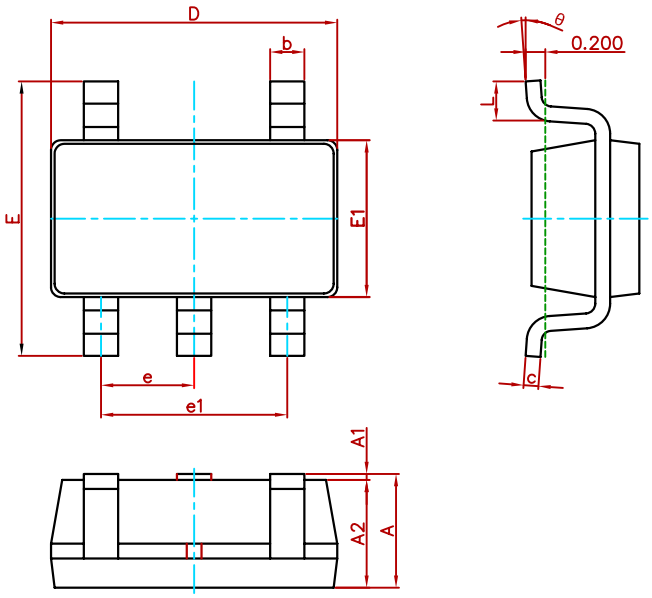
Output with Excessive Capacitive Load



THD+N vs. Frequency

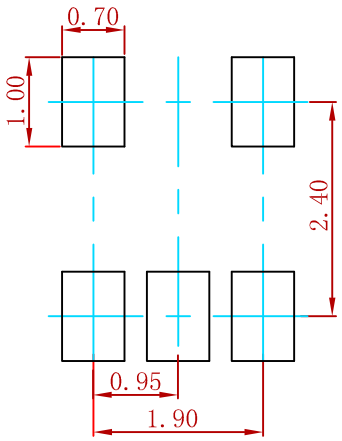


SOT-23-5L Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	2.650	2.950	0.104	0.116
E1	1.500	1.700	0.059	0.067
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

SOT-23-5L Suggested Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:±0.05mm.
3.The pad layout is for reference purposes only.

REEL SPECIFICATION

P/N	PKG	QTY
LMV321M5X(MS)	SOT-23-5	3000pcs

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